	Instruction Set					Control Signals																					
Bits	[15..11]	[11..9]	[8..6]	[5..3]	[2..0]																						
	OP Code	R dest	R1	R2	INDX	PC_ENABLE	WB_PC	IF JUMP	IN ENABLE	REG WRITE	WRITE_CCR	LATCH_OUT	WRITE_FLAGS	ENABLE_IF_BRANCH	MEM_DATA_SOURCE	MEM_ADDRESS_SOURCE	WHICH_FLAG(3) ZNC	ALU_ENABLE	ALU_FUNCTION(3)	OP_SOURCE	MEM_WRITE	MEM_READ	STACK_OP	WB_CONTROL	IF HLT(to hazard detection)	IF_INT
NOP	00000	XXX	XXX	XXX	XXX	1																					
HLT	00001	XXX	XXX	XXX	XXX	0																			1		
SET C	00010	XXX	XXX	XXX	XXX	1					1						001	1	000								
RET	00011	XXX	XXX	XXX	XXX	1	1				1											1	10	0			
RTI	00100	XXX	XXX	XXX	XXX	1	1				1		1				111					1	10	0	0		
OUT Rs1	00101	addr	XXX	XXX	XXX	1	0	0	0	0		1						1	100								
PUSH Rs1	00111	addr	XXX	XXX	XXX	1	0								00	1					1		01				
POP Rdst	01000	addr	XXX	XXX	XXX	1				1						1						1	10	0			
JZ Rs1	01001	addr	XXX	XXX	XXX	1	1	1						1			100	1	100								
JN Rs1	01010	addr	XXX	XXX	XXX	1	1	1						1			010	1	100								
JC Rs1	01011	addr	XXX	XXX	XXX	1	1	1						1			001	1	100								
JMP Rs1	01100	addr	XXX	XXX	XXX	1	1	1						1			000	1	100								
CALL Rs1	01101	addr	XXX	XXX	XXX	1	1								10	1		1	100		1		01	1			
NOT Rdest, R1	01111	addr	addr	XXX	XXX	1				1	1		0				110	1	001					1			
INC Rdest, R1	10000	addr	addr	XXX	XXX	1				1	1		0				111	1	010					1			
MOV Rdest, R1	10001	addr	addr	XXX	XXX	1				1								1	100					1			
ADD Rdest, R1, R2	10011	addr	addr	addr	XXX	1				1	1		0				111	1	110	00				1			
SUB Rdest, R1, R2	10100	addr	addr	addr	XXX	1				1	1		0				111	1	110	00				1			
AND Rdest, R1, R2	10101	addr	addr	addr	XXX	1				1	1		0				110	1	111	00				1			
LDM Rdest, Imm	11000	addr	addr	XXX	XXX	1				1	1		0				111	1	110	00				1			
LDD Rdest, R1, Imm	11001	addr	addr	XXX	XXX	1				1						0		1	110	01		1		0			
STD Rdest, R1, Imm	11010	addr	addr	XXX	XXX	1									00	0		1	110	01	1						
IOW Rdest, Imm	11011	addr	XXX	XXX	XXX	1	0		0	1								1	101	01				1			
IN Rdest	11100	addr	XXX	XXX	XXX	1	0		1	1								1	101	01				1			
INT indx	11111	XXX	XXX	XXX	0 or 2	1	1								10	1		1	110	10	1		01	1		1	

Bits	FORWARDING UNIT						
	FORWARD_MEM	FORWARD_ALU	IF/ID	ID/EX	EX/MEM	MEM/WB	
NOP							
HLT							
SET C							
RET			FLUSH				
RTI							
OUT Rs1							
PUSH Rs1							
POP Rdst							
JZ Rs1							
JN Rs1							
JC Rs1							
JMP Rs1							
CALL Rs1							
NOT Rdest, R1							
INC Rdest, R1							
MOV Rdest, R1							
ADD Rdest, R1, R2							
SUB Rdest, R1, R2							
AND Rdest, R1, R2							
IADD Rdest, R1, IMM							
LDD Rdest, R1, IMM							
STD Rdest, R1, IMM							
LDM Rdest, imm							
IN Rdest							
INT indx							

ALU_FUCTIONS	CODE
SET C	000
NOT	001
INC	010
SUB	011
BUFF A	100
BUFF B	101
ADD	110
AND	111
STACK OP	
NO OP	00
PUSH	01
POP	10
WB CONTROL	
DATA_MEM	0
WRITE_FLAGS	
ALU	0
MEM(RETI)	1
OP SOURCE	
Rs2	00
IMM/INPUT	01
INDX	10
DATA_ALU	1
Rs1(data)	01
PC & Flags	10
MEM_ADDRESS_SOURCE	
ADDRESS	0
STACK	1